

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1. (Currently amended) A solid-state battery, comprising:
a plurality of stacked thin film layers formed on a substrate,
wherein the solid-state battery is at least partially integrated within the stacked layers, at least a portion of the substrate comprises at least a portion of the solid-state battery, and the
solid-state battery has a thickness less than about 1 μm.
2. (Original) The solid-state battery of claim 1 wherein the stacked thin film layers comprise a cathode layer, an electrolyte layer, and an anode layer.
3. (Original) The solid-state battery of claim 2 wherein (i) the electrolyte layer is disposed proximate the cathode layer, the electrolyte layer having a first surface contacting the cathode layer; and (ii) the anode layer is disposed proximate the electrolyte layer, the anode layer contacting a second surface of the electrolyte layer.
4. (Original) The solid-state battery of claim 2 wherein the electrolyte comprises silicon dioxide.
5. (Original) The solid-state battery of claim 4 wherein the electrolyte is substantially free of lithium.
6. (Original) The solid-state battery of claim 4 wherein the electrolyte layer has a thickness less than about 100 nm.
7. (Original) The solid-state battery of claim 2 wherein at least one of the anode and cathode comprises silicon.
8. (Withdrawn) The solid-state battery of claim 2 wherein at least one of the anode and the cathode comprises lithium.

9. (Withdrawn) The solid state battery of claim 8 wherein at least one of the anode and the cathode comprises at least one of a lithium-metal alloy, a III-V compound, a II-VI compound, a nitride, lithium intercalated into graphite, and an oxide.
10. (Withdrawn) The solid-state battery of claim 9 wherein at least one of the anode and the cathode comprises at least one of Li₂₂Sn₅, LiCoO₂, titanium nitride, nickel silicide, cobalt silicide, titanium oxide, and a transition metal oxide.
11. (Original) The solid-state battery of claim 2 wherein the cathode layer has a thickness less than about 500 nm.
12. (Original) The solid-state battery of claim 2 wherein the anode layer has a thickness less than about 500 nm.
13. (Cancelled)
14. (Currently amended) The solid-state battery of claim [[13]]1 wherein the substrate comprises an anode.
15. (Withdrawn) The solid-state battery of claim 13 wherein the substrate comprises a cathode.
16. (Original) The solid-state battery of claim 1 wherein the battery is integrated within and operatively connected to an integrated circuit defined on the substrate.
17. (Original) The solid-state battery of claim 1, further comprising:
a contact layer disposed over the battery.
18. (Withdrawn) A method for forming a solid-state battery, comprising the steps of:
forming a plurality of thin film layers over a substrate; and
 patterning the plurality of thin film layers to define the solid-state battery,
wherein the solid-state battery has a thickness less than approximately 1 μm .

Amendment and Response

Serial No. 10/823,083

Page 4 of 9

19. (Withdrawn) The method of claim 18 wherein the plurality of thin film layers includes a cathode layer, an electrolyte layer, and an anode layer.

20. (Withdrawn) The method of claim 19 wherein the electrolyte layer comprises silicon dioxide.

21. (Withdrawn) The method of claim 20 wherein forming the electrolyte layer comprises at least one of dry oxidation and wet oxidation.

22 (Withdrawn) The method of claim 20 wherein the electrolyte layer has a thickness less than approximately 500 nm.

23. (Withdrawn) The method of claim 18 wherein forming the layers comprises sputtering.

24. (Withdrawn) The method of claim 18 wherein forming the layers comprises chemical vapor deposition.

25. (Withdrawn) The method of claim 18 wherein patterning the layers comprises photolithography.

26. (Withdrawn) The method of claim 18 wherein patterning the layers comprises etching.

27. (Withdrawn) The method of claim 18 wherein the solid-state battery is integrated within and operatively connected to an integrated circuit disposed on the substrate.

28. (Currently amended) A solid-state battery, comprising:
a plurality of stacked thin film layers formed on a substrate,
wherein the solid-state battery is at least partially integrated within the stacked thin film layers, at least a portion of the substrate comprises at least a portion of the solid-state battery, the stacked thin film layers comprise an electrolyte layer and the electrolyte layer has a thickness of less than about 100 nm.

29. (Original) The solid-state battery of claim 28 wherein the stacked thin film layers further comprise a cathode layer and an anode layer.
30. (Original) The solid-state battery of claim 29 wherein (i) the electrolyte layer is disposed proximate the cathode layer, the electrolyte layer having a first surface contacting the cathode layer; and (ii) the anode layer is disposed proximate the electrolyte layer, the anode layer contacting a second surface of the electrolyte layer.
31. (Original) The solid-state battery of claim 29 wherein the electrolyte comprises silicon dioxide.
32. (Original) The solid-state battery of claim 29 wherein the electrolyte is substantially free of lithium.
33. (Original) The solid-state battery of claim 31 wherein the electrolyte layer has a thickness less than about 10 nm.
34. (Original) The solid-state battery of claim 29 wherein at least one of the anode and cathode comprises silicon.
35. (Withdrawn) The solid-state battery of claim 29 wherein at least one of the anode and the cathode comprises lithium.
36. (Withdrawn) The solid state battery of claim 35 wherein at least one of the anode and the cathode comprises at least one of a lithium-metal alloy, a III-V compound, a II-VI compound, a nitride, lithium intercalated into graphite, and an oxide.
37. (Withdrawn) The solid-state battery of claim 36 wherein at least one of the anode and the cathode comprises at least one of $\text{Li}_{22}\text{Sn}_5$, LiCoO_2 , titanium nitride, nickel silicide, cobalt silicide, titanium oxide, and a transition metal oxide.

38. (Original) The solid-state battery of claim 29 wherein the cathode layer has a thickness less than about 500 nm.
39. (Original) The solid-state battery of claim 29 wherein the anode layer has a thickness less than about 500 nm.
40. (Cancelled)
41. (Currently amended) The solid-state battery of claim [[40]]28 wherein the substrate comprises an anode.
42. (Withdrawn) The solid-state battery of claim 40 wherein the substrate comprises a cathode.
43. (Original) The solid-state battery of claim 28 wherein the battery is integrated within and operatively connected to an integrated circuit defined on the substrate.
44. (Original) The solid-state battery of claim 28 further comprising:
a contact layer.
45. (Withdrawn) A method for forming a solid state battery, comprising the steps of:
forming a plurality of thin film layers over a substrate, and
chemical mechanical polishing at least one of the thin film layers.
46. (Withdrawn) A method for forming a solid-state battery, comprising the steps of:
forming a plurality of thin film layers over a substrate; and
 patterning the plurality of thin film layers to define the solid-state battery, the solid-state battery including an electrolyte layer,
wherein the electrolyte layer has a thickness of less than about 100 nm.
47. (Withdrawn) The method of claim 46 wherein the plurality of thin film layers includes a cathode layer and an anode layer.

Amendment and Response

Serial No. 10/823,083

Page 7 of 9

48. (Withdrawn) The method of claim 46 wherein the electrolyte layer comprises silicon dioxide.

49. (Withdrawn) The method of claim 48 wherein forming the electrolyte layer comprises at least one of dry oxidation and wet oxidation.

50. (Withdrawn) The method of claim 48 wherein the electrolyte layer has a thickness less than approximately 10 nm.

51. (Withdrawn) The method of claim 46 wherein forming the layers comprises sputtering.

52. (Withdrawn) The method of claim 46 wherein forming the layers comprises chemical vapor deposition.

53. (Withdrawn) The method of claim 46 wherein patterning the layers comprises photolithography.

54. (Withdrawn) The method of claim 46 wherein patterning the layers comprises etching.

55. (Withdrawn) The method of claim 46 wherein the solid-state battery is integrated within and operatively connected to an integrated circuit disposed on the substrate.

56. (Withdrawn) The method of claim 46 wherein at least one of the thin film layer comprises polysilicon.

57. (Original) A solid-state battery, comprising:

a thin solid electrolyte layer,

wherein the electrolyte layer comprises an initial state and an operative state, the electrolyte layer in the initial state is substantially free of ions, and ions conduct through the electrolyte layer in the operative state during operation of the battery.